MULTIMEDIA UNIVERSITY

STUDENT ID NO

MULTIMEDIA UNIVERSITY

FINAL EXAMINATION

TRIMESTER 3, 2015/2016

TIS3151 – SOFTWARE RELIABILITY AND QUALITY ASSURANCE

(All sections / Groups)

2nd June 2016
9 am - 11 am
(2 Hours)

INSTRUCTIONS TO STUDENTS

1. This Question paper consists of 5 pages excluding the cover page with 6 Questions only.

2. Attempt all **SIX** questions. All questions carry equal marks and the distribution of the marks for each question is given.

3. Please print all your answers in the Answer Booklet provided.

QUESTION 1

a. 'Quality Control' and 'Quality Assurance' serve different objectives. Explain how they differ.

[2 Marks]

b. Can a software package that successfully served an organization for a long period suddenly change its nature (quality) and become bugged? Explain with THREE important reasons.

[3 Marks]

c. Given below are extracts from requirements documents/feedback from customers. Identify the quality factor it refers to and justify your answer:

(i) A new software system to be installed in the main branch of a bank, which operates 120 branches, requires that it will not fail on average more than 10 minutes per month.

[1 Mark]

(ii) An outdoor meteorological unit, equipped with 1000 milli Ampere hour cell, should be capable of supplying the power requirements of the unit for at least 30 days.

[1 Mark]

(iii) The new version of loan contract software is really accurate but it takes at least two weeks to train a new staff member to use this software.

[1 Mark]

(iv) The R & D team of a washing machine manufacturer was instructed to develop the software required for the firmware to be suitable for all six variations of model 2015 washing machines.

[1 Mark]

(v) The member registration system allows only the manager to access members' information and members are allowed to access their information only when the username and password matches.

[1 Mark]

QUESTION 2

a. Oresoft Sdn. Bhd. would like to apply for either ISO or CMMI standards. State any ONE benefit to the company if any of these standards are obtained.

[1 Mark]

....*Continued*

b. One of the principles of ISO 9001:2008 is having 'all people in an organization are involved' in the quality process. How does this benefit the organization? State at least FOUR benefits.

[4 Marks]

c. Robert as a quality manger wants to conduct CMMI Appraisals. How will he justify to the staff the benefits of these appraisals? [State at least 3 points]

[3 Marks]

d. CMMI supports two improvement paths using levels. What are these TWO levels?

[2 Marks]

QUESTION 3

a. Reliability means quite different things depending on the system and the users of the system. How would you define 'Reliability'?

[2 Marks]

b. Reliability specifications are essential for a software product. Identify suitable **Reliability metrics** and the **Failure class** that can be assigned for each of the assessment below:

(i) An ATM system fails to operate with any card which is inserted. Software must be restarted to correct failure

[1 Mark]

(ii) The magnetic strip data cannot be read on an undamaged card which is input.

[1 Mark]

(iii) A pattern of transaction across the network causes database corruption

[1 Mark]

c. Steven, who is the programming head, suggests to his team essential reliable programming practices that is required for fault free software development. State any TWO of these practices.

[2 Marks]

...Continued

d. Consider the following code:

```
// File Name : Example.java
import java.io.*;
public class Example{

  public static void main(String args[]){
      int a[] = new int[2];
      System.out.println("Access element three :" + a[3]);
  }
}
```

Modify the above code to include Exception Handling.

[3 Marks]

QUESTION 4

a. Srikanth, the project manager, obtains the contract to develop banking software. His team has been developing similar software and this would be the 10th time.

(i) What development model do you think Srikanth would use for his new project?

[1 Mark]

(ii) What are the advantages of using this model referring to his team's experience in developing similar software?

[3 Marks]

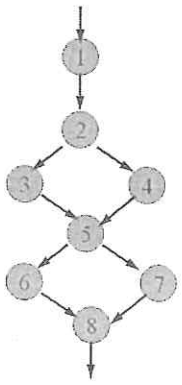
b. For the diagram given below find:

(i) The minimum number of paths.

[1 Mark]

(ii) The full coverage of the path.

[2 Marks]



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c. Wong is assigned to conduct a major contract review. What are the guidelines he needs to follow to ensure a proper review is conducted?

[3 Marks]

QUESTION 5

a. Systemsoft Sdn. Bhd. Project manager chooses to use **function point** method to measure the **size** of the system they were about to develop. State any THREE reasons for his choice of measurement method.

[3 Marks]

b. Tan is required to carry out the Verification and Validation activity of the design phase.

(i) Which part of the Verification and Validation plan does he need to refer to?

[1 Mark]

(ii) What are the activities he needs to carry out during this phase?

[3 Marks]

c. The Quality Manager wants to conduct Verification and Validation activities for the new complex project. How will he convince the management on the benefits of Verification and Validation activities? State any two benefits.

[2 Marks]

d. What are 'Help Desk Services' with reference to the software industry?

[1 Mark]

QUESTION 6

a. How does the Deming Wheel concept of Plan-Do-Check-Act benefit total quality management (TQM)?

[3 Marks]

b. Mohammed is asked to find out the current customer needs in the market. What are the ways in which he will be able to know the voice of the customer?

[3 marks]

...Continued

c. A project team was working towards a deadline on tight schedule. One of the main programmers, who had health issues, was hospitalized suddenly due to a heart attack. The team leader tried to find a replacement for him at that juncture. What type of risk management did the team leader show?

[2 Marks]

d. Intelsoft released accounting software at a lower price than its competitors. But the product did not sell very well and users preferred other software. The feedback received was that the software by Intelsoft was too difficult to use, its downtime was very long and it had many unnecessary features.

(i) Identify the area of risk that was not considered during the development of the software.

(ii) Suggest how this risk could have been minimized.

[2 Marks]

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